

and limitations of NTFP. Monetary comparisons and projections are made, but these are, of course, dependent on the assumptions that underlie them. Nonetheless, it can be argued that under appropriate circumstances, that is, those that employ enrichment plantings, multiple extraction strategies, and/or refined agroforestry techniques, NTFP extraction has economic and social advantages over timber harvest, when the benefits of the latter are spread over long rotational or fallow periods. Yet, questions of sustainability remain unanswered, for we cannot

look to the future and predict what impacts forthcoming global events will have on forests and forest peoples. Whether or not the extraction of NTFP is a viable solution to forest and cultural preservation is not a decision to be left to science or peoples of the developed world. Rather the obligation is to assure that those people who are directly affected have the knowledge to chart their own course of action and destiny. This volume serves that obligation in admirable fashion.

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L. H. Bailey Hortorium

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HORTICULTURE COLUMN

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Q. Hardy? Recently there was a question posted on the IPS e-mail list asking for opinions about the cold-hardiness of the Foxtail Palm, *Wodyetia bifurcata*.

A. There was a flurry of replies from different palm growing areas, where this species might be put to the test, but the answers were not in agreement; one respondent compared *Wodyetia's* cold-hardiness to that of a Queen Palm, while another thought it less hardy than *Adonidia merrillii*, a difference of opinion of at least seven degrees F. Members of The International Palm Society have always been concerned about the cold hardiness of palms since so many of us grow our favorite plants near or beyond the fringes of where mother nature intended them to grow. We are fascinated by stories of beautiful palms, perhaps untried in our areas, that have survived frighteningly low temperatures and we want to try to grow these in our own gardens. Yet when we compare lists of cold tolerances of the same species from different sources, in separate states or countries there is often a significant difference between what is considered hardy or tender, as with the Foxtail Palms already mentioned. Obviously some of this difference is in perception, and this may depend on one's prox-

imity to the Equator; someone who lives closer to it than you do simply doesn't understand your problem. In other words if you live in an area that never suffers hard freezes, *Wodyetia* and Queen palms are equally hardy. Undoubtedly differences in overall climate and even topography can affect the freeze-survivability of a given palm species, and the duration of the freeze is very important too. For one who is starting out in the business or pastime of growing palms in a freeze prone area, a trusted mentor who lives in a similar climate, but 50 miles farther from the Equator can be a valuable source of information, and should be encouraged to write a book. Perhaps it would be interesting and useful to consider, in this column, some of the reasons why a given palm species might be considered hardy in one part of the world but less so in another, even when subjected to the same low temperatures. I'll give some reasons why I think this might be so and I trust some of you will contribute your own thoughts and experiences on the subject.

A few years ago during a moderately severe central Florida freeze a number of *Archontophoenix cunninghamiana* that I had, both in the ground and in large containers, were damaged quite a bit especially on their upper leaf

surfaces. The temperatures had only gone down to 27 degrees F (Fahrenheit, -3° Celsius) but had stayed below freezing for about 10 hours. I was a little surprised at the damage since this species is said to be the most cold hardy of the crownshaft palms. I called my friend who had sold me most of the *A. cunninghamiana* and complained a little about their lack of durability in the cold, when I told her that they were planted out in the open she replied, "they're only hardy if they're protected." I thought about this a lot and to me it seemed like a nonsense statement, something like "this watch is waterproof as long as it doesn't get wet." Eventually, with the help of someone wiser, and farther from the Equator, I realized that it wasn't the 27 degrees that damaged my *A. cunninghamiana* but frost. The word frost, unfortunately, has more than one meaning; here in Florida which is one of the more humid of the freeze-prone palm growing areas, frost refers to the minute ice crystals that form when water vapor condenses at a temperature below freezing, a light frost can happen here even when thermometer readings are well above freezing. In other parts of the world "frost" is simply a synonym for freeze and its mention does not always indicate the presence of the minute ice crystals that are known as frost in Florida. Frost (the Florida kind), forms only in areas with open sky above, and, apparently, can injure some palms that otherwise could stand a lower temperature, resulting perhaps in a report of cold-hardiness that conflicts with that recorded in a climate where frost is rare. The truly hardy palms that I have any experience with are not damaged by frost alone.

Not everyone has the same definition of cold-hardiness at a given temperature; does it mean that the palm came through a freeze of 22 degrees F (-6° C), for instance, unharmed and unaffected in any way? Or many could call it hardy at that temperature if it simply survived having lost all of its foliage and was able to struggle back to face another winter the next year. The term "bud hardy" is sometimes used to describe a palm that can take such punishment without apparent permanent damage. Once a field of several hundred Queen Palms which I was growing was subjected to temperatures in the low twenties F. for 3 nights in a row. All of the palms had their foliage killed and all of them that were large enough to be dug and sold (the 12-18 ft range), died, but several dozen small, newly planted Queen palms recov-

ered and suffered no permanent damage. Are young Queen Palms hardier than older ones? Were these young palms grown from seeds that came from a source toward the south of the Queen Palm's natural range, and, therefore were hardier? No, they survived because at their early stage of development their buds were still at or even a little below ground level and the warmth of the ground was enough to save them while the older trees with their buds well above ground didn't have that bit of protection. It's very easy to spot this "phenomenon" for what it is in a field of several hundred palms all of the same species. But if it happened to one or two species in a collection of many different species of different sizes (which is what many of us have in our gardens), we might be tempted to think that the little palm which was able to recover from the terrible freeze, while so many large ones did not, was indeed "bud hardy." A similar freeze a few years later, when the palm had formed an aboveground trunk could kill that same "bud hardy" palm. This is not to say that there aren't any "bud hardy;" at least some of the *Hyphaenes* would fit this description in most of central Florida, several mature plants having survived many prolonged freezes in at least a couple of locations here.

Seeds and plants are often misidentified. A classic case is *Livistona chinensis*, which in the first half of the 20th century was known by some nurserymen as *Latania borbonica*. *Latania borbonica* is also a synonym of *Latania lontaroides*. As recently as 10 or 12 years ago seeds of *Livistona chinensis* were being distributed as *Latania* sp., and were described as having survived very low temperatures at a location in Italy. Fortunately the seeds of *Livistona* and *Latania* are so different that the mistake was quickly corrected, but when the confusion involves two species of the same genus it may not be so easy to detect. A simple mislabelling of seeds that came from a botanic garden in Cuba in 1964 led to a certain amount of discussion and confusion among palm growers a couple of decades later. The seeds, which were of *Livistona saribus*, were mistakenly labelled as *L. muelleri*. Some of these palms found their way into some prominent public and private collections in Florida, and were noticed, particularly since they had the ability to tolerate prolonged freezing temperatures about as well as *Livistona chinensis*. Some collectors obtained and planted *L. muelleri* as a result, but as it turns

out *L. muelleri* is quite sensitive to frost and cannot stand freezes nearly as well as *L. chinensis*, or *L. saribus*. It should be noted that the form of *L. saribus* with maroon colored petioles is less cold hardy than the one with green petioles. The fact that *L. saribus*, whose native range is in the lowland equatorial tropics, can stand cold as well as it does, at least in my part of the world, is rather surprising. If anyone knows of a palm from a similar climate that can survive a freeze as well I hope you will tell us about it. I don't think I've been able to cover all of the possible reasons for conflicting reports of cold-hardiness in palms, I really think it's difficult to be a worldwide expert on such an issue, except in a general way, so I hope we'll have some input from other sources.

Q. The bud of one of my Coconut seedlings, which is about 6 months old, was attacked by some kind of fungus; the top stopped growing, and then rotted away. White worm-like larvae were crawling around the bud area. What could they be and why did it happen? I have three other seedlings that grow just fine. Also, all of these plants are outside. Andy G., Jacksonville, Florida.

A. Coconuts are truly tropical palms, they thrive best in areas that have warm weather year round. The winters in north Florida, where you live, will have a significant effect on the health and appearance of a Coconut palm, even when the winter is relatively mild, and even if you cover them up during the coldest nights.

Seedlings are especially prone to suffer from lack of warmth, and when they are in this weakened condition they may be more likely to suffer from a fungus which could rot the bud; bacterial rot may also occur. The insect larvae are a secondary problem; they arrived after the disease had already begun to kill your Coconut seedling. You can drench the bud of your remaining seedlings with copper fungicide, which is effective against bacteria as well as fungus. Copper should not be used too frequently since it has a certain degree of toxicity to all plants, even small quantities of copper will kill bromeliads. Always read and follow the instructions on the label. In the future you may want to apply fungicide to young palm seedlings to prevent the sort of bud rot diseases that can occur even in warmer conditions. Some growers have had good results using an organic fungicide called Mycostop, and there are, of course, a number of chemicals available. Remember, that in the case of cold damaged palms it's best to use a copper based fungicide, since other products are effective against fungus only and not the bacteria which often kills cold damaged palms.

Members are invited to contribute, or make suggestions for this column. I also invite members to submit horticultural questions for inclusion along with an answer. I'll try to respond to all questions personally, whether they are used in the column or not, and as quickly as possible in case prompt action is necessary.

DESIGN COMPETITION FOR LOGO

The Board of the IPS invites artists worldwide to submit an IPS logo in black and white and of simple design involving palms. The winning artist will be recognized.

Please submit your designs by March 1, 2000 to: Scott Zona, Fairchild Tropical Garden, 11935 Old Cutler Rd., Miami, FL 33256-4329.